is not so much influenced by the type of the seed layer when the thickness of the seed layer falls within the range defined in this Example. However, low resistance materials having a small specific resistance are unfavorable to the seed layer. This is because, if the shunt current flow is increased in the layer, it would be difficult to make the current center near to the free layer. Therefore, for the seed layer, it is desirable to use materials having as high as possible resistance and capable of enhancing the function of the antiferromagnetic film. For example, in place of using low-resistance NiFe alone, any of Cr, N, Hf, W, Ta and the like may be added to NiFe so as to increase the specific resistance of the NiFe layer. In (9-2), used is NiFeCr in place of NiFe.

As the antiferromagnetic film, used is PtMn in (9-1), and IrMn in (9-2). PtMn is advantageous in that the blocking temperature is high, that Hu.a. is large, and that the thermal stability for MR is lowered little after thermal treatment. With PtMn being used, therefore, high MR and high ΔRs could be realized. Like in the top-type structure, the merit of the noble metal-containing antiferromagnetic film of PtMn in the bottom-type structure is significant in that high MR could be maintained still after thermal treatment and even when ultra-thin free layers are used. In place of PtMn, PdPtMn is also employable. The preferred thickness range of the layer falls between 5 nanometers and 30 nanometers, more preferably

between 7 nanometers and 15 nanometers.

The merit of IrMn in (9-2) is that it can maintain its characteristics even when its thickness is smaller than the thickness of PtMn. Therefore, IrMn is suitable to narrow-gap heads for high-density recording. Preferably, the IrMn thickness falls between 3 nanometers and 13 nanometers. The IrMn film is also an antiferromagnetic film containing the noble metal Ir, and its thermal stability for good MR ratio is excellent. In place of IrMn, also employable is noble metal-containing RuRhMn.

As mentioned above, PtMn, IrMn and PdPtMn are the best for the antiferromagnetic film. However, the bias point control in the spin valve films of the invention is not limited by the material of the antiferromagnetic film. In the invention, also employable are any other antiferromagnetic films of NiO, CrMnPt, NiMn, α-Fe_2O_3, etc.

As the ferromagnetic material for the two pinned layer in the Synthetic AF structure, herein used is an CoFe alloy. In place of this, also employable are Co, NiFe and even laminate films of NiFe with Co or CoFe. Regarding the constituent materials and the film thicknesses, the same as in the top-type structures of Examples 1 and 2 noted above could apply to the bottom-type structure herein. The most significant object of the Synthetic pinned layer structure, which is the key point in the invention, is to reduce the pinned stray magnetic filed,

as so mentioned hereinabove. The difference in Ms×t between the upper and lower ferromagnetic layers shall be closely related to the thickness of the high-conductivity layer as provided adjacent to the free layer.

Regarding the spacer, the same idea as that for the top-type structure shall apply also to the bottom-type structure. Also in the bottom-type structure, the spacer layer is as thin as possible. Concretely, the spacer thickness preferably falls between 1.5 nanometers and 2.5 nanometers, more preferably between 1.8 nanometers and 2.3 nanometers.

In this Example, the free layer is of a laminate film of NiFe/Co. Regarding the thickness and the material of the free layer, the same as in the top-type structure shall apply to the bottom-type structure. However, the NiFe composition for the subbing film differs between the top-type structure and the bottom-type structure, and the preferred NiFe composition for realizing low magnetostriction in the bottom-type structure differs in some degree from that in the top-type structure. Concretely, in the case of a laminated free layer of NiFe/CoFe, the positive side shifting of the magnetostriction in the laminated NiFe/CoFe free layer to be caused by the reduction in the thickness of NiFe in the bottom-type structure is smaller than that in the top-type structure. Therefore, in the bottom-type structure, Ni-poorer NiFe compositions could well realize the reduction in